

SEQUENCE LISTING

<110> Boehringer Ingelheim (Canada) Ltd.

<120> Purified Active HCV NS2/3 Protease

<130> 13/082

<150> 60/256,031

<151> 2000-12-15

<160> 21

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1230

<212> DNA

<213> HCV

<220>

<221> CDS

<222> (1)...(1230)

<400> 1

atg gac cgg gag atg gct gca tcg tgc gga ggc gcg gtt ttc ata ggt 48
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly
1 5 10 15

ctt gca ctc ttg acc ttg tca cca tac tat aaa gtg ctc ctc gct agg 96
Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg
20 25 30

ctc ata tgg tgg tta cag tat tta atc acc aga gtc gag gcg cac ttg 144
Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu
35 40 45

caa gtg tgg atc ccc cct ctc aat gtt cgg gga ggc gcg gat gcc atc 192
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile
50 55 60

atc ctc ctc acg tgc gca gtc cac cca gag cta atc ttt gac atc acc 240
Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr
65 70 75 80

aaa ctc ctg ctc gcc ata ttc ggt ccg ctc atg gtg ctc cag gca ggc 288
Lys Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95

ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt gcg 336
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala
100 105 110

tgt atg ttg gtg cgg aag gct gcg ggg ggt cat tat gtc caa atg gcc 384
Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125

ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat ctc	432
Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu	
130 135 140	
act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca gtg	480
Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val	
145 150 155 160	
gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc acc	528
Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr	
165 170 175	
tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg ccc	576
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro	
180 185 190	
gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat aat	624
Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn	
195 200 205	
ttt gaa ggg cag ggg tgg cga ctc ctt gcg ccc atc acg gcc tac tcc	672
Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser	
210 215 220	
caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca ggc	720
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly	
225 230 235 240	
cgg gac aag aac cag gtc gag ggg gag gtt caa gtg gtc tcc acc gct	768
Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala	
245 250 255	
aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg tgt tgg act gtc	816
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	
260 265 270	
ttc cat ggc gcc ggc tca aag acc ttg gcc ggc ccc aaa ggc cca atc	864
Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	
275 280 285	
acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag gcg	912
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala	
290 295 300	
ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg gac	960
Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp	
305 310 315 320	
ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cgg cgg	1008
Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg	
325 330 335	
ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac ttg	1056
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu	
340 345 350	

aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct gtg 1104
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
355 360 365

ggc atc ttc cgg gct gct gtg tgc acc cgg ggg gtt gca aaa gcg gtg 1152
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
370 375 380

gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt agc 1200
Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser
385 390 395 400

gct tgg cgt cac ccg cag ttc ggt ggt taa 1230
Ala Trp Arg His Pro Gln Phe Gly Gly *
405

<210> 2
<211> 409
<212> PRT
<213> HCV

<400> 2
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly
1 5 10 15
Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg
20 25 30
Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu
35 40 45
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile
50 55 60
Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr
65 70 75 80
Lys Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala
100 105 110
Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125
Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
130 135 140
Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145 150 155 160
Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr
165 170 175
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro
180 185 190
Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn
195 200 205
Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
210 215 220
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
225 230 235 240
Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
245 250 255
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
260 265 270

Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
 275 280 285
 Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
 290 295 300
 Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp
 305 310 315 320
 Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
 325 330 335
 Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
 340 345 350
 Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
 355 360 365
 Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
 370 375 380
 Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser
 385 390 395 400
 Ala Trp Arg His Pro Gln Phe Gly Gly
 405

<210> 3
 <211> 1011
 <212> DNA
 <213> HCV

<220>
 <221> CDS
 <222> (1)...(1005)

<400> 3
 atg aaa aag aaa aag ctc gag cat cac cat cac cat cac act agt gca 48
 Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala
 1 5 10 15
 ggc ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt 96
 Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg
 20 25 30
 gcg tgt atg ttg gtg cgg aag gct gcg ggg ggt cat tat gtc caa atg 144
 Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met
 35 40 45
 gcc ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat 192
 Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His
 50 55 60
 ctc act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca 240
 Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala
 65 70 75 80
 gtg gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc 288
 Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile
 85 90 95
 acc tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg 336
 Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu
 100 105 110

ccc gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat	384
Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp	
115 120 125	
aat ttt gaa ggg cag ggg tgg cga ctc ctt gcg ccc atc acg gcc tac	432
Asn Phe Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr	
130 135 140	
tcc caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca	480
Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr	
145 150 155 160	
ggc cgg gac aag aac cag gtc gag ggg gag gtt caa gtg gtc tcc acc	528
Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr	
165 170 175	
gct aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg tgt tgg act	576
Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr	
180 185 190	
gtc ttc cat ggc gcc tca aag acc ttg gcc ggc ccc aaa ggc cca	624
Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro	
195 200 205	
atc acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag	672
Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln	
210 215 220	
gcg ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg	720
Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser	
225 230 235 240	
gac ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cg	768
Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg	
245 250 255	
cgg ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac	816
Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr	
260 265 270	
ttg aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct	864
Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala	
275 280 285	
gtg ggc atc ttc cgg gct gct gtg tgc acc cgg ggg gtt gca aaa gcg	912
Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala	
290 295 300	
gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt	960
Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser	
305 310 315 320	
agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa	1005
Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys *	
325 330	
ggatcc	1011

<210> 4
 <211> 334
 <212> PRT
 <213> HCV

<400> 4
 Met Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala
 1 5 10 15
 Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg
 20 25 30
 Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met
 35 40 45
 Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His
 50 55 60
 Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala
 65 70 75 80
 Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile
 85 90 95
 Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu
 100 105 110
 Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp
 115 120 125
 Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
 130 135 140
 Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr
 145 150 155 160
 Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr
 165 170 175
 Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr
 180 185 190
 Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro
 195 200 205
 Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln
 210 215 220
 Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser
 225 230 235 240
 Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg
 245 250 255
 Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr
 260 265 270
 Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala
 275 280 285
 Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala
 290 295 300
 Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser
 305 310 315 320
 Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys
 325 330

<210> 5
 <211> 20
 <212> DNA
 <213> HCV

<400> 5
 ccatggaccg ggagatggct

<210> 6
 <211> 63
 <212> DNA
 <213> HCV

<400> 6
 ggatccttaa ccaccgaact gcgggtgacg ccaagcgcta ctagtccgca tggtagttc 60
 cat 63

<210> 7
 <211> 46
 <212> DNA
 <213> HCV

<400> 7
 gctcgagcat caccatcacc atcacactag tgcaggcata accaaa 46

<210> 8
 <211> 45
 <212> DNA
 <213> HCV

<400> 8
 aacaatggat ctttactttt tcttttacc accgaactgc gggtg 45

<210> 9
 <211> 45
 <212> DNA
 <213> HCV

<400> 9
 acctgccata tgaaaaagaa aaagctcgag catcaccatc accat 45

<210> 10
 <211> 303
 <212> PRT
 <213> HCV

<400> 10
 Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile
 1 5 10 15
 Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln
 20 25 30
 Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp
 35 40 45
 His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu
 50 55 60
 Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile
 65 70 75 80
 Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly
 85 90 95
 Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala
 100 105 110
 Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala
 115 120 125
 Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu
 130 135 140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser
 145 150 155 160
 Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp
 165 170 175
 Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly
 180 185 190
 Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp
 195 200 205
 Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser
 210 215 220
 Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg
 225 230 235 240
 Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser
 245 250 255
 Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His
 260 265 270
 Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys
 275 280 285
 Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
 290 295 300

<210> 11
 <211> 393
 <212> PRT
 <213> HCV

<400> 11
 Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly Leu Ala Leu Leu
 1 5 10 15
 Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg Leu Ile Trp Trp
 20 25 30
 Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu Gln Val Trp Ile
 35 40 45
 Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile Ile Leu Leu Thr
 50 55 60
 Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr Lys Leu Leu
 65 70 75 80
 Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly Ile Thr Lys Val
 85 90 95
 Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val
 100 105 110
 Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala Phe Met Lys Leu
 115 120 125
 Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln
 130 135 140
 Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro
 145 150 155 160
 Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp
 165 170 175
 Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg
 180 185 190
 Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln
 195 200 205
 Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg
 210 215 220
 Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn
 225 230 235 240

Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe
 245 250 255
 Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe His Gly Ala
 260 265 270
 Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr
 275 280 285
 Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala
 290 295 300
 Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val
 305 310 315 320
 Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg
 325 330 335
 Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser
 340 345 350
 Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg
 355 360 365
 Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro
 370 375 380
 Val Glu Ser Met Glu Thr Thr Met Arg
 385 390

<210> 12
 <211> 380
 <212> PRT
 <213> HCV

<400> 12
 Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg Leu
 1 5 10 15
 Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu Gln
 20 25 30
 Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile Ile
 35 40 45
 Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr Lys
 50 55 60
 Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly Ile
 65 70 75 80
 Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala Cys
 85 90 95
 Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala Phe
 100 105 110
 Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu Thr
 115 120 125
 Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val Ala
 130 135 140
 Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr Trp
 145 150 155 160
 Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val
 165 170 175
 Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe
 180 185 190
 Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln
 195 200 205
 Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg
 210 215 220
 Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr
 225 230 235 240

Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe
 245 250 255
 His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr
 260 265 270
 Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro
 275 280 285
 Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu
 290 295 300
 Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly
 305 310 315 320
 Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys
 325 330 335
 Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly
 340 345 350
 Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp
 355 360 365
 Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
 370 375 380

<210> 13
 <211> 352
 <212> PRT
 <213> HCV

<400> 13
 Ala His Leu Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg
 1 5 10 15
 Asp Ala Ile Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe
 20 25 30
 Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu
 35 40 45
 Gln Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu
 50 55 60
 Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val
 65 70 75 80
 Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr
 85 90 95
 Asp His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp
 100 105 110
 Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys
 115 120 125
 Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser
 130 135 140
 Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro
 145 150 155 160
 Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr
 165 170 175
 Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser
 180 185 190
 Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val
 195 200 205
 Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys
 210 215 220
 Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys
 225 230 235 240
 Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly
 245 250 255

Trp	Gln	Ala	Pro	Pro	Gly	Ala	Arg	Ser	Met	Thr	Pro	Cys	Thr	Cys	Gly
			260					265					270		
Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile	Pro	Val
			275				280						285		
Arg	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val
			290			295					300				
Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly
			305			310			315					320	
His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala
				325			330						335		
Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg
			340			345							350		

<210> 14
 <211> 341
 <212> PRT
 <213> HCV

<400> 14															
Val	Arg	Gly	Gly	Arg	Asp	Ala	Ile	Ile	Leu	Leu	Thr	Cys	Ala	Val	His
						1	5		10					15	
Pro	Glu	Leu	Ile	Phe	Asp	Ile	Thr	Lys	Leu	Leu	Leu	Ala	Ile	Phe	Gly
						20		25						30	
Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val
						35		40					45		
Arg	Ala	Gln	Gly	Leu	Ile	Arg	Ala	Cys	Met	Leu	Val	Arg	Lys	Ala	Ala
						50		55				60			
Gly	Gly	His	Tyr	Val	Gln	Met	Ala	Phe	Met	Lys	Leu	Ala	Ala	Leu	Thr
						65		70		75			80		
Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	Thr	Pro	Leu	Gln	Asp	Trp	Ala	His
						85		90					95		
Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	Pro	Val	Ile	Phe	Ser
						100		105					110		
Asp	Met	Glu	Val	Lys	Ile	Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys
						115		120				125			
Gly	Asp	Ile	Ile	Ser	Gly	Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu
						130		135			140				
Ile	Leu	Leu	Gly	Pro	Ala	Asp	Asn	Phe	Glu	Gly	Gln	Gly	Trp	Arg	Leu
						145		150		155			160		
Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
						165		170				175			
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
						180		185			190				
Glu	Val	Gln	Val	Val	Ser	Thr	Ala	Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys
						195		200			205				
Val	Asn	Gly	Val	Cys	Trp	Thr	Val	Phe	His	Gly	Ala	Gly	Ser	Lys	Thr
						210		215			220				
Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp
						225		230		235			240		
Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	Pro	Pro	Gly	Ala	Arg	Ser	Met	Thr
						245		250				255			
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala
						260		265			270				
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu
						275		280			285				
Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu
						290		295			300				

Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys
305 310 315 320
Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met
325 330 335
Glu Thr Thr Met Arg
340

<210> 15
<211> 292
<212> PRT
<213> HCV

<400> 15
Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly
1 5 10 15
Gly His Tyr Val Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly
20 25 30
Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln Asp Trp Ala His Ala
35 40 45
Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp
50 55 60
Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly
65 70 75 80
Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile
85 90 95
Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu
100 105 110
Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys
115 120 125
Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu
130 135 140
Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val
145 150 155 160
Asn Gly Val Cys Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu
165 170 175
Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln
180 185 190
Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro
195 200 205
Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp
210 215 220
Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser
225 230 235 240
Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu
245 250 255
Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr
260 265 270
Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu
275 280 285
Thr Thr Met Arg
290

<210> 16
 <211> 303
 <212> PRT
 <213> HCV

<400> 16

Ala	Gly	Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	Gln	Gly	Leu	Ile
1				5					10						15
Arg	Ala	Cys	Met	Leu	Val	Arg	Lys	Ala	Ala	Gly	Gly	His	Tyr	Val	Gln
			20					25						30	
Met	Ala	Phe	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp
			35					40				45			
Ala	Leu	Thr	Pro	Leu	Gln	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu
			50			55					60				
Ala	Val	Ala	Val	Glu	Pro	Val	Ile	Phe	Ser	Asp	Met	Glu	Val	Lys	Ile
	65				70				75					80	
Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Ser	Gly
			85					90						95	
Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	Leu	Leu	Gly	Pro	Ala
		100				105							110		
Asp	Asn	Phe	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala
		115				120						125			
Tyr	Ser	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu
		130				135				140					
Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser
	145				150				155					160	
Thr	Ala	Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp
			165					170					175		
Thr	Val	Phe	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly
		180				185						190			
Pro	Ile	Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp
		195				200					205				
Gln	Ala	Pro	Pro	Gly	Ala	Arg	Ser	Met	Thr	Pro	Cys	Thr	Cys	Gly	Ser
		210				215					220				
Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile	Pro	Val	Arg
	225				230				235				240		
Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser
		245				250						255			
Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His
		260				265					270				
Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys
		275				280					285				
Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	
		290				295					300				

<210> 17
 <211> 301
 <212> PRT
 <213> HCV

<400> 17

Ala	Gly	Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	Gln	Gly	Leu	Ile
1				5					10					15	
Arg	Ala	Cys	Met	Leu	Val	Arg	Lys	Ala	Ala	Gly	Gly	His	Tyr	Val	Gln
			20					25				30			
Met	Ala	Phe	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp
			35					40				45			

His	Leu	Thr	Pro	Leu	Gln	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu
50					55					60					
Ala	Val	Ala	Val	Glu	Pro	Val	Ile	Phe	Ser	Asp	Met	Glu	Val	Lys	Ile
65				70					75					80	
Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Ser	Gly
				85					90					95	
Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	Leu	Leu	Gly	Pro	Ala
	100					105							110		
Asp	Asn	Phe	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Pro	Ile	Thr	Ala	Tyr	Ser
	115					120						125			
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly
	130				135						140				
Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala
145					150				155				160		
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val
		165						170					175		
Phe	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile
		180				185						190			
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala
		195				200						205			
Pro	Pro	Gly	Ala	Arg	Ser	Met	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp
	210				215						220				
Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg
225				230					235				240		
Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu
		245				250						255			
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val
		260				265						270			
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val
		275				280						285			
Asp	Phe	Ile	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg			
		290			295						300				

<210> 18

<211> 303

<212> PRT

<213> HCV

<400> 18

Ala	Gly	Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	Gln	Gly	Leu	Ile
1				5				10		15					
Arg	Ala	Cys	Met	Leu	Val	Arg	Lys	Ala	Ala	Gly	Gly	His	Tyr	Val	Gln
			20				25					30			
Met	Ala	Phe	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp
			35				40				45				
His	Leu	Thr	Pro	Leu	Gln	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu
			50			55					60				
Ala	Val	Ala	Val	Glu	Pro	Val	Ile	Phe	Ser	Asp	Met	Glu	Val	Lys	Ile
			65			70			75			80			
Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala	Gly	Asp	Ile	Ile	Ser	Gly	
			85				90					95			
Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	Leu	Leu	Gly	Pro	Ala
			100			105						110			
Asp	Asn	Phe	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala
			115			120						125			
Tyr	Ser	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu
		130				135					140				

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser
 145 150 155 160
 Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp
 165 170 175
 Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly
 180 185 190
 Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp
 195 200 205
 Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser
 210 215 220
 Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg
 225 230 235 240
 Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser
 245 250 255
 Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His
 260 265 270
 Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys
 275 280 285
 Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
 290 295 300

<210> 19

<211> 11

<212> PRT

<213> HCV

<220>

<221> VARIANT

<222> (1)...(1)

<223> Asp labeled with anthranilyl

<221> VARIANT

<222> (6)...(6)

<223> Xaa at position 6 is Abu

<221> VARIANT

<222> (6)...(7)

<223> Abu-A between 6 and 7 is C(O)-O

<221> VARIANT

<222> (9)...(9)

<223> Tyr at position 9 is derivatized with 3-NO₂

<400> 19

Asp Asp Ile Val Pro Xaa Ala Met Tyr Thr Trp
 1 5 10

<210> 20

<211> 6

<212> PRT

<213> HCV

<220>

<221> VARIANT

<222> (1)...(1)

<223> Asp labeled with anthranilyl

<221> VARIANT
<222> (6) ... (6)
<223> Xaa at position 6 is Abu

<400> 20
Asp Asp Ile Val Pro Xaa
1 5

<210> 21
<211> 10
<212> PRT
<213> HCV

<400> 21
Ser Phe Glu Gly Gln Gly Trp Arg Leu Leu
1 5 10